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Synthesis of mass exchange network for batch processes—Part II: Minimum units target and batch network design

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Abstract

The first part of this series of papers (Chem. Eng. Sci. 59(5) (2004) 1009) presented a methodology for identifying the minimum utility targets for a mass exchange network (MEN) for a batch process. This paper describes the methodology for setting the minimum number of mass exchange units target and a procedure for designing a maximum mass recovery network that features the minimum utility targets. The time-grid diagram and the overall time-grid diagram that include the time dimension in network design have been introduced to provide a better representation of the mass exchange network for a batch process. The systematic network design procedure also includes a technique to simplify and evolve the preliminary batch MEN to reduce the number of mass exchangers to the minimum.

Keywords: Mass exchange network design; Maximum mass recovery; Pinch analysis; Minimum units; Batch process systems; Time-grid diagram.

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